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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,539	02/27/2004	Bruno De Man	129405-1/YOD GERD:0049	9455

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EXAMINER
SUCHECKI, KRYSTYNA

ART UNIT	PAPER NUMBER
2882	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/789,539	DE MAN ET AL.	
	Examiner	Art Unit	
	Krystyna Suchecki	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27 and 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15-18, 20-25,27 and 29* is/are rejected.

7)☒ Claim(s) *14,19 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5, 9, 11-13, 16-18, 22-25 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Mihara (US 6,807,248).

Regarding Claims 1-3, 5, 9, 11-13, 16-18, 22-25 and 29, Mihara teaches a CT imaging system, method for CT imaging and computer program provided on one or more computer readable media, comprising: a stationary ring X-ray source (30a-30c) comprising two or more duplicate, azimuthally offset, thermionic (Column 13, lines 1-8) X-ray tube discrete emission points (Column 17, lines 49-58), wherein each emission point, when activated, emits a respective conical or fan-shaped (Column 5, lines 54) stream of radiation through a respective portion of a field of view (Figure 5) such that successive emissions by different emission points occur at different view angles; and a flat panel energy discriminating detector array (Col. 9, lines 35-39 and Col. 15, lines 15-20) comprising a plurality of detector elements, wherein each detector element may generate one or more signals in response to the respective streams of radiations; a

system controller (CPU, not shown, see Col. 7, that communicates with the emission and acquisition components (Column 9, lines 40-52)) configured to control the two or more emission points and to acquire the one or more signals from the plurality of detector elements, and a computer system comfigured to receive the one or more signals and to process the one or more signals to generated one or more images and an operator workstation configured to display the one or more images (Column 11, lines 27-31), wherein the two or more emission points are effectively rotataed by activation of stationary emission points disposed in a ring about a field of view such that each emission point, when activated, emits a respective, sequential stream of radiation from a respective view angle, wherein a first subset of the two or more emission points are activated at a first set of view angles, and wherein a second subset of the tow or more emission points are activated at a subset of the first set of view angles. [Mihara shows the subsets of emission points since subset 30a can be applied to a portion of the set of view angles subtended by the sum of angles covered by subsets 30a and 30b, and subset 30b can be applied to the remaining portion of the view angles subtended by the set of view angles.]

Claims 1, 9, 10, 17 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sohval (US 4,637,040).

Regarding Claims 1, 9, 10, 17 and 21, Figure 1 of Sohval teaches a CT imaging system and method for CT imaging, comprising an X-ray source comprising two or more discrete emission points (33) wherein each emission point, when activated, emits a

respective fan-shaped stream of radiation through a respective portion of a field of view (Figure 12) such that successive emissions by different emission points occur at different view angles (Figures 3 and 4), a detector array comprising a plurality of detector elements, wherein each detector element may generate one or more signals in response to the respective streams of radiation and a system controller configured to control the two or more emission points and to acquire the one or more signals from the plurality of detector elements (Column 8, lines 28-44 and Column 9, lines 33-60) wherein the two or more emission points are rotated by mechanically rotating the emission points about the field of view such that each emission point, when activated, emits a respective stream of radiation from a respective view angle (Column 9, lines 33-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sohval in view of Yamazaki (US 5,570,403).

Regarding Claim 6, Sohval teaches a CT imaging system having a detector as above for claim 1. Sohval teaches a "flying focal spot" method, wherein a source is switched in position with respect to a detector so that a detector is read by respective sources as they are switched to form two slices in the same position.

Sohval fails to teach an energy discriminating detector.

Yamazaki also teaches a CT imaging system using a "flying focal spot" method, and teaches the addition of an energy discriminating detector so that plural types of energy characteristics can be obtained so as to achieve plural kinds of tomographic data (Abstract and Embodiment 4).

Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the energy discriminating detector of Yamazaki in the CT imaging system of Sohval in order to achieve a system that can obtain plural kinds of tomographic data (Yamazaki, Abstract).

Claims 15, 20 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mihara in view of Popescu (US 6,507,639).

Regarding Claims 15, 20 and 27 Mihara teaches a CT imaging system, method for CT imaging, computer program provided on one or more computer readable media, as above.

Mihara fails to teach the flux of each respective stream of radiation as determined based on at least a respective view angle.

Popescu teaches that it is known in the art to limit the flux emitted by a stream of radiation based on at least a respective view angle so as to modulate dose or protect portions of a patient or physician (Column 1, lines 35-65).

Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine and emit respective streams of radiation in the

device of Mihara as taught be Popescu so as to modulate dose or protect portions of a patient or physician (Popescu, Column 1, lines 35-65).

Claims 4, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mihara in view of Taskar (US 6,674,837).

Regarding Claims 4, 7 and 8, Mihara teaches a CT imaging system with sequential emission from two or more discrete emission points as above for claim 1. Mihara also teaches that it is desirable to densely arrange the X-ray emission points so as to improve resolution and increase san speed (Column 17, lines 49-58).

Mihara fails to teach that the two or more discrete emission points comprise field emitters and the X-ray source comprises duplicate, offset emission points along a longitudinal axis.

Taskar teaches a field emitter array (item 20) for use in CT imaging systems (Column 6, line 3) having two or more discrete emission points and an X-ray source comprising duplicate, offset emission points along a longitudinal axis. The narrowness of the beam eliminates scatter and results in a system with quasi-collimation, or a system where collimation is not actively needed. An additional benefit of Taskar is achieved by replacing traditional expanding beams with the field emitters to have the ability to have a bare minimum exposure or high resolution, with automatic adjustment of the flux to include only the flux necessary to ensure adequate discrimination (Column 5, line 44- Column 6, line 10).

Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the filed emitter of Taskar in the system of Mihara to eliminate scatter without active collimation and to have a bare minimum exposure or high resolution, with automatic adjustment of the flux to include only the flux necessary to ensure adequate discrimination (Taskar, Column 5, line 44- Column 6, line 10). The dense nature of Taskar's emitter would thereby enhance the high resolution goal of Mihara.

Allowable Subject Matter

Claims 14, 19 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 14, 19 and 26 contain allowable subject matter for at least the reasons given in the Office action dated 05/31/05.

Response to Arguments

Applicant's arguments, see Response, filed 09/02/05, with respect to the rejection(s) of at least claim(s) 1 under Wagner have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Mihara.

Applicant's arguments with respect to the Taskar references have been considered but they are not persuasive. While Taskar (US 6,674,837) does not specifically refer to his beam shape as necessarily a pencil, fan or cone beam shape, an understanding of emission yields the appropriate claimed shape in "miniature" form

(Figure 1 and Column 3, lines 42-57 and Column 4, lines 14-32). As can be seen in Figure 1, an expanding, albeit small, beam is emitted in the system by way of an elongated forward projecting main lobe. The result is a minute cone beam that can offer better resolution and exposure selection than traditionally larger expanding beams (Column 6, lines 1-10). By replacing "a single, expanding beam" it is understood that Taskar aims to expose a much smaller area than the traditional beam could expose, and does not intend to limit his beam to a pencil type. [Pencil beams are traditionally formed by collimation, which is absent in the Taskar reference.] Given the lobular shape of Taskar's beam, a non-conical interpretation is not persuasive.

Applicant's arguments with respect to the Light reference are rendered moot by the new grounds of rejection set forth above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Block (US 2005/0100132) is of interest for teaching sequential emission from multiple discrete points while mechanically rotating.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (571) 272-2495. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/KO/
ks

Craig E Church

Craig E. Church
Primary Examiner